REMARKS

With the entry of the present amendments, Claims 22-43 and 47-56 are pending in the application. Claims 1-21 and 44-46 have been canceled without prejudice to Applicants' right to prosecute these claims in a timely filed continuation application. Claim 49 has been corrected so that it depends from Claim 48, rather than from Claim 47. New claims 50-56 have been added. Support for the new claims may be found throughout the application as filed, including, but not limited to:

Claim 50: Paragraph 0037.
Claim 51: Paragraph 0037.
Claim 52: Paragraph 0031.
Claim 53: Paragraph 0035.
Claim 54: Paragraph 0011.
Claim 55: Claim 1, as originally filed.
Claim 56: Claim 4, as originally filed.

In view of the following remarks, reconsideration and withdrawal of the rejections to the application in the Office Action is respectfully requested.

I. Rejection of Claims 1-21 and 44-46.

In the Office Action, Claims 1-21 were rejected under 35 U.S.C. § 103(a) over U.S. Patent Application No. 2003/0067256, issued to Srivastava (hereinafter "Srivastava") in view of various secondary references. Claims 44-46 were rejected over U.S. Patent Application No. 2003/0057821, issued to Fink (hereinafter "Fink") in view of various secondary references. In order to expedite the prosecution of the application, Applicants have cancelled claims 1-21 and 44-46, thereby rendering these rejections moot. For this reason, Applicants respectfully request that this rejection be withdrawn.

II. Rejection of Claims 22, 23, 26, 30-33, and 40 Under 35 U.S.C. § 103(a).

Claims 22, 23, 26, 30-33, and 40 were rejected under 35 U.S.C. § 103(a) as unpatentable over Srivastava in view of Fink. Applicants respectfully traverse.

In order to establish a *prima facie* case of obviousness, three criteria must be met: (1) the cited references must provide some motivation to modify the reference teachings; (2) there must be a reasonable expectation of success; and (3) the resulting combination must teach or suggest all of the limitations of the rejected claims. (MPEP 2142) In addition, if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. (MPEP 2143.01 V)

In support of the rejection of independent Claim 22, the Examiner asserts:

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the phosphor material comprising a plurality of nanoparticles, the nanoparticles comprising a Group IV semiconductor disclosed by Fink in the light emitting device disclosed by Srivastava, for the purpose of higher efficiency.

In making this statement, the Examiner has overlooked important differences between the cathode ray tubes (CRTs) and liquid crystal devices (LCDs) of Fink and the white light illumination systems of Srivastava. These differences make the phosphor materials used in Fink inappropriate for use in the illumination systems of Srivastava. Based on these differences, one of ordinary skill in the art would not be motivated to make the substitution suggested by the Examiner. Moreover, the substitution suggested by the Examiner is not founded in a reasonable expectation of success.

Fink describes a silicon nanoparticle-based phosphor material for use in CRTs and LCDs. (See, for example, paragraphs 3 and 18.) CRTs are designed to create multicolored images on a phosphor-coated faceplate by aiming an electron beam at the faceplate. The phosphor materials are deposited as pixels (or subpixels) which luminesce in different colors. (See paragraph 3 of

Fink.) The color of light emitted from a given pixel depends on the nature of the phosphor material that has been deposited at that pixel, while the intensity of light emitted depends on the intensity of the electron beam at that pixel. (See paragraph 3 of Fink.) Thus, by adjusting the position of an electron beam on the phosphor-coated screen, a multicolored image can be produced. The LCDs referred to in Fink utilize a faceplate having pixels that transmit different colors of light in order to produce multicolored images. In the invention of Fink, CRTs and LCDs are made by filtering silicon nanoparticles by size and depositing the filtered nanoparticles on the face plate of the CRT or LCD as subpixels, wherein each subpixel contains nanoparticles having a narrow size distribution which emit light of a specific color, typically red, blue or green. This is discussed at length throughout Fink. See, for example, paragraphs 18, 20 and 23-36 and figure 5.

In contrast to Fink, Srivastava discloses a white light illumination system that includes a phosphor material made from a compound containing various alkaline earth and rare earth metals. (See, for example, paragraph 36.) These compounds provide a single luminescent phosphor material with a broad spectrum emission that provides a white light. (See, for example, paragraphs 32, 36 and 39.) Thus, the phosphor material of Srivastava (a white light emitting compound) is very different in nature from the phosphor material of Fink (a collection of individual subpixels, each of which emits radiation of a particular color (i.e., non-white radiation)). In view of these differences, it cannot reasonably be said that one of ordinary skill in the art would be motivated to substitute the multicolor-emitting phosphor of Fink for the white light emitting compound of Srivastava. In fact, the nature of the two phosphor materials is so different that one of ordinary skill in the art would not reasonably expect such a substitution to successfully produce a white light emitting device. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness and Applicants respectfully request that the rejection of Claim 22, and Claims 23, 26, 30-33 and 40 which depend therefrom, be withdrawn.

Applicants further note that there is no motivation to modify the phosphor material of Fink by mixing the silicon nanoparticles to provide a collection of polydisperse nanoparticles that

emit white light, because such a modification would render the phosphor material unsatisfactory for its intended purpose as a phosphor in a CRT or LCD.

III. Rejection of Claims 24, 25, 27-29, and 34-39 Under 35 U.S.C. § 103(a).

Claims 24, 25, 27-29 and 34-39 were rejected under 35 U.S.C. § 103(a) as unpatentable over Srivastava in view of Fink and various other secondary references. Applicants respectfully traverse.

Claims 24, 25, 27-29 and 34-39 each depend directed or indirectly from Claim 22. Thus, for all of the reasons discussed in Section II, above, with respect to Claim 22, Applicants respectfully submit that Claims 24, 25, 27-29 and 34-39 are also in condition for allowance and respectfully request that this rejection be withdrawn.

With regard to Claim 37, Applicants further note that the Examiner has failed to identify (and Applicants were unable to locate) any description of a core/shell nanoparticle comprising a Si core and a Si_3N_4 or SiC shell in the cited prior art references. For this additional reason, Applicants request that the rejection of Claim 37 be withdrawn.

IV. Rejection of Claims 47-49 Under 35 U.S.C. § 102(b).

Claims 47-49 were rejected under 35 U.S.C. § 102(b) as unpatentable over U.S. Patent Application Publication No. 2004/0023010, issued to Bulovic et al. (hereinafter "Bulovic"). In support of this rejection the Examiner asserts:

> Bulovic discloses a phosphor material comprising a plurality of domains disposed on an organic film (paragraph 62), each domain comprising a plurality of luminescent semiconductor nanoparticles having a monodisperse size distribution (paragraph 34.)

Applicants respectfully traverse.

To establish a *prima facie* case of anticipation, a cited reference must teach each and every limitation of the rejected claim. (MPEP 2131) Bulovic fails to teach each and every limitation of rejected Claim 47.

Contrary to the Examiner's assertion, paragraph 62 of Bulovic teaches only "*homogeneously* dispersed films of nanocrystals *in* organic matrices." (Emphasis added.) Such a structure is very different from a material comprising a plurality of domains of monodisperse nanoparticles *disposed on* (i.e., not "in") an organic film, as recited in Claim 47. Therefore, Bulovic fails to teach each and every limitation of Claim 47. For this reason, Applicants respectfully request that the rejection of Claim 47, and of Claims 48-49 which depend therefrom, be withdrawn.

In view of the foregoing remarks, Applicants respectfully submit that all of the claims remaining in the applications are in condition for allowance and favorable action thereon is respectfully solicited.

Respectfully submitted,

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